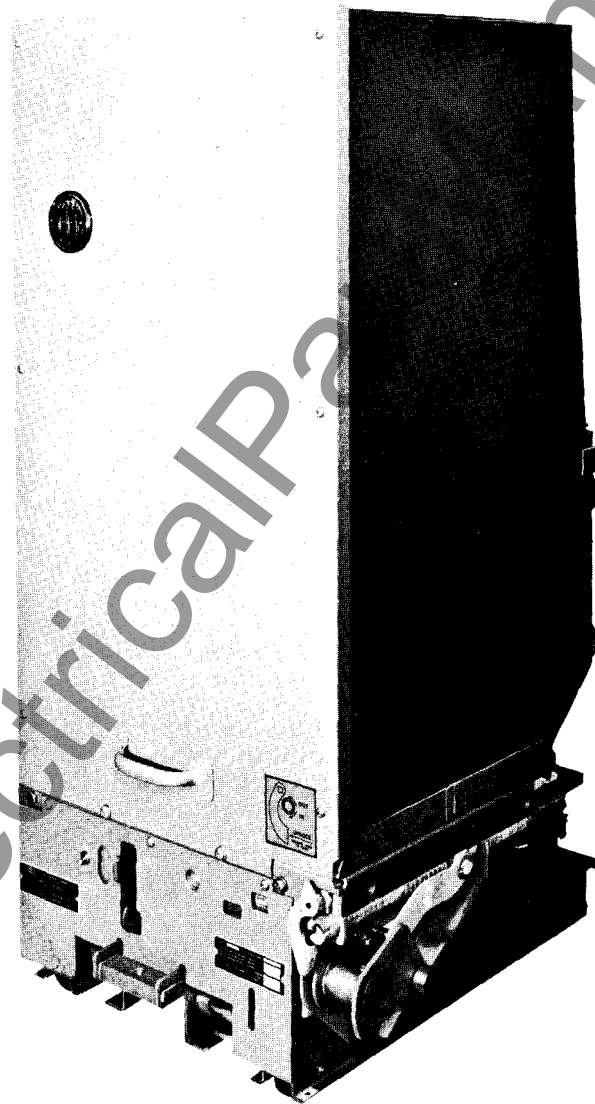


IB-2807-51C

METAL-CLAD SWITCHGEAR

INSTRUCTIONS

5 KV POWER CIRCUIT BREAKERS
TYPE 5HK75, 5HK150, 5HK250 AND 5HK350



I-T-E CIRCUIT BREAKER COMPANY

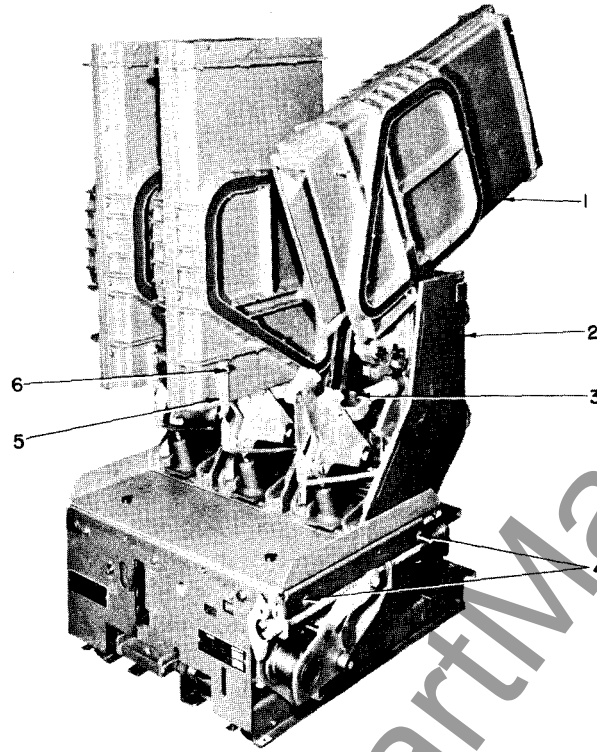


Fig 1.—View Showing Arc Chute and Contact Structure

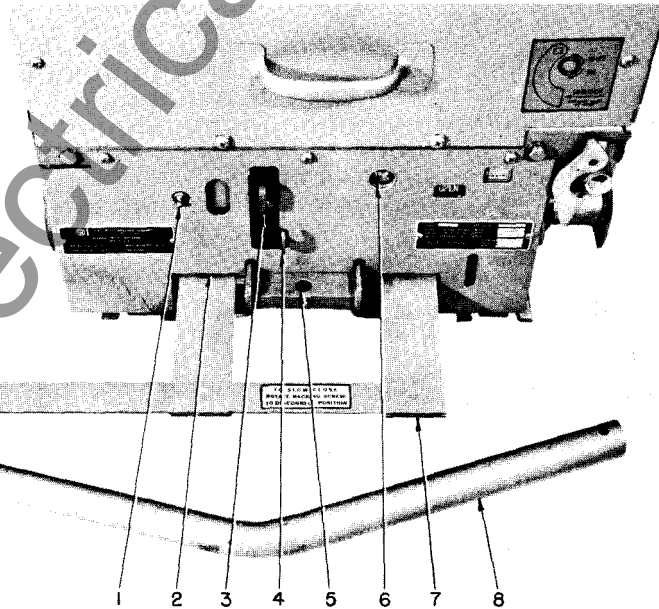


Fig. 2—Front View of Control Panel

PHOTO E40249-A

PHOTO E40250-A
COVER PHOTO E40248

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INSTRUCTIONS FOR 5 KV POWER CIRCUIT BREAKERS TYPE 5HK75, 5HK150, 5HK250 AND 5HK350

CIRCUIT BREAKER INSTALLATION

GENERAL

The following procedure should be observed when installing the circuit breaker into the switchboard.

Caution: To insure closing springs are discharged and that the circuit breaker is in open position.

Turn power control switch (1, Fig. 2) "OFF". Pull the manual close lever (4) and push manual trip button (6).

The circuit breaker may be raised by means of a lifting yoke fastened at points (4, Fig. 1) located on each side of the base frame.

INSTALLATION INSPECTION

Inspect condition of circuit breaker arc chutes, contacts and electrical connections.

Use test jack connected to control voltage source for breaker electrical operation when removed from compartment. Insert test jack into breaker secondary contacts located at lower right side of the circuit breaker when viewed from the rear.

REMOVING BARRIER

Remove two lower front sheet screws.

Raise the rear brace above arc chutes, then draw barrier forward and away from circuit breaker.

REMOVING ARC CHUTES (See Fig. 1)

Remove nut (6) to disconnect return connection bar (5). Grasp the arc chute (1) at the front and top and tilt on its pivot towards the rear until it rests on the lead support (2). If necessary, the arc chute may be raised out of its retaining guide slots and removed from circuit breaker.

ARC CHUTE EXAMINATION

Examine arc chutes carefully before placing into service. Look for any breakage to liner plates and arc chute plates. Check for presence of any foreign particles such as chips of ceramic and metal. Inspect exterior for any damage or deformation.

ARC CHUTE CLEANING

It is essential that arc chutes are clean. Wipe all metal parts with a dry cloth to remove any dirt or dust accumulation. Wipe all insulated parts, terminal bushings with a cloth saturated with an oil free solvent to remove any oil film.

MANUAL SLOW CLOSE TO CHECK CONTACT PRESSURE (See Fig. 2)

Engage manual charge handle (8) with charging lever (3). Pump charging lever until breaker closing springs snap into charge position.

Insert BOTH tangs of spring retainer bracket (7) into holes of closing spring tubes (2).

Pull manual close lever (4) to discharge closing springs onto tangs of spring retainer bracket (7).

Engage manual charge handle (8) with charging lever (3) then pump to slow close breaker contacts. Check contact pressure as in Adjustment Section, then push manual trip button (6) to trip breaker.

To remove spring retainer bracket (7) from circuit breaker, continue pumping until closing springs are again heard to snap into charged position. Circuit breaker is now ready to be closed.

Discharge closing springs by pulling manual close lever (4) and pushing manual trip button (6).

INSTALLING ARC CHUTES (See Fig. 1)

Position arc chute (1) on its rear pivot pin, then lower slowly into position. NOTE: Securely fasten front return connection bar (5) by its nut (6).

INSTALLING BARRIER

Lift barrier when sliding onto circuit breaker and allow rear brace to drop behind the arc chutes. Secure barrier front sheet by two retaining screws.

INSTALLING CIRCUIT BREAKER INTO COMPARTMENT

Engage racking crank (4, Fig. 3) and push racking unlocking lever (3) clockwise, then rotate racking screw counterclockwise until stopped.

Engage the fifth wheel with hole (5, Fig. 2); guide and push circuit breaker into compartment until stopped. Again engage racking crank and rotate clockwise until racking mechanism automatically stops at "DISCONNECT" position. (Breaker is now held captive in compartment.)

To rack circuit breaker to "TEST" position, push racking unlocking lever (3, Fig. 3) clockwise approximately 1/4 turn then release unlocking lever. Continue cranking until racking mechanism automatically stops at "TEST" position. (If charging power switch (1, Fig. 2) is not provided, springs will automatically charge when approaching "TEST" position.)

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the I-T-E Circuit Breaker Company.

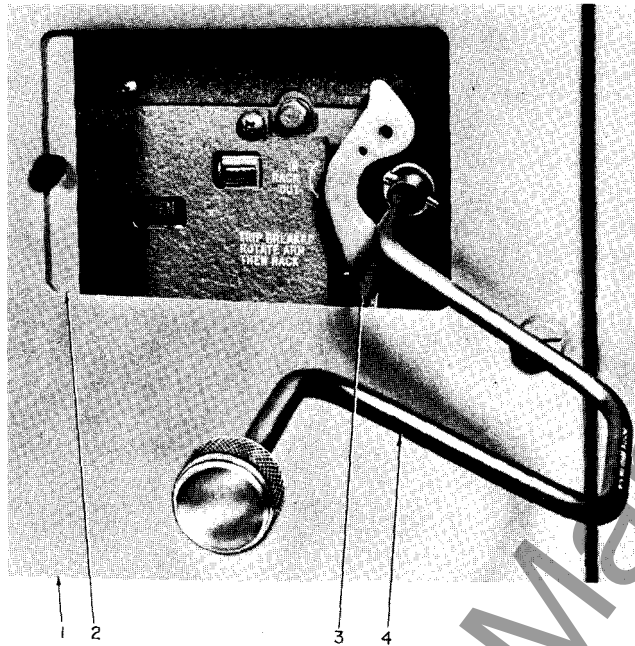


Fig. 3—Method of Racking Circuit Breaker

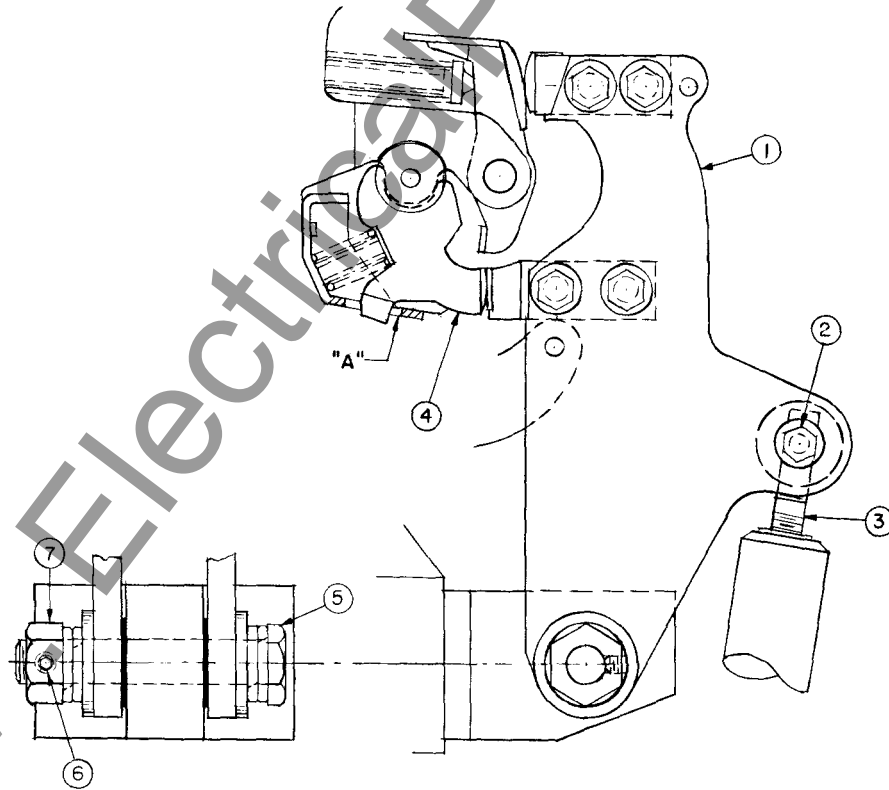


Fig. 4—Contact Pressure and Bridge Pivot Pressure



The circuit breaker operation may be checked in "TEST" position by turning charging power switch (1) to "ON" position and springs will automatically charge.

If available, close circuit breaker by local close button and trip by local trip button. Close and trip circuit breaker by remote control switch.

When racking circuit breaker to "CONNECTED" position, close compartment door (1, Fig 3) and open sliding panel (2).

Rotate unlocking lever (3) clockwise and turn racking crank (4) approximately 1/4 turn, then release unlocking lever. Continue cranking until racking mechanism automatically stops at "CONNECTED" position. The circuit breaker may now be closed or tripped by remote control switches.

MANUAL CLOSING OPERATION

The circuit breaker conditions may be observed through sliding panel (2, Fig. 4) or by opening compartment door (1).

If the circuit breaker is completely uncharged, manually charge closing springs with manual charge lever (3, Fig. 2) and pull manual close lever (4) with a lanyard from a safe distance.

If the springs are charged, pull manual close lever (4) with a lanyard from a safe distance.

Should closing not occur when pulling the manual close lever (4), the closing springs may be partially charged. Continue charging until closing springs are completely charged (audible snap). Pull manual close lever (4) with a lanyard from a safe distance.

CIRCUIT BREAKER REMOVAL

To remove circuit breaker from "CONNECTED" position, trip the breaker by the remote control switch.

Open sliding door (2, Fig. 3) in front compartment door (1). Engage racking crank (4) and push unlocking lever (3) clockwise. Rotate racking crank (4) counter-clockwise approximately a quarter turn, then release unlocking lever. Continue cranking until racking mechanism automatically stops at "TEST" position.

Repeat same operation for "DISCONNECT" and "OUT" positions. Note: A charged circuit breaker will automatically discharge during the "OUT" position. Open compartment door and withdraw circuit breaker out of compartment.

MAINTENANCE

These circuit breakers require minimum maintenance. It is recommended that an established maintenance program be set up to provide for an inspection at least once every six months or after every 1000 operations, whichever occurs first. After a fault operation or soon as possible to determine condition of contacts, arc chutes, barriers and electrical connections.

Arc chutes which have been in service for periods of time should be checked for any breakage or excessive erosion to liner plates and arc chute plates.

Check jump gap area for deterioration or breakage. Closely observe that there is no erosion or pitting of the

rear horn spacer bushings, warped or cracked jump gap plates and eroded disconnect pivot bolt and bushings. Also check any erosion or distortion to front arc horn.

Remove dirt or grease from contacts with a cloth saturated with an oil free solvent. Discoloration of main contacts does not indicate damage. However, this condition may be removed by opening and closing the circuit breaker under no-load conditions.

Should the main contacts show slight pitting, check contact pressure after referring to Adjustment Section. For manual slow close to check contact pressure, refer to Installation Inspection Section. A moderate amount of pitting will not interfere with the arcing contacts operation. If necessary to dress arcing contacts to remove small burrs, cover the puffer nozzle (3, Fig. 1) with a cloth to prevent filing entry. Follow contact contour with light wipps of a fine file. Do not try to eliminate pitting entirely.

ADJUSTMENTS

These circuit breakers are adjusted, tested and inspected before leaving the factory.

However, upon inspection, some changes in the contact sequence or mechanism adjustments may be required due to transit rough handling or abnormal conditions after installation. We recommend circuit breakers installed in switchboards be withdrawn and moved to a suitable test area.

CONTACT PRESSURE (See Fig. 4)

With bridge (1) in closed position, the stationary main contact (4) deflection should be 1/8 inch, plus or minus 1/64 inch.

Make adjustments by loosening set screw (2) on left pole, then close circuit breaker. Adjust left pole by turning adjusting stud (3) in or out as required.

Check proper adjustment by using a 1/8 inch drill (snug fit) at point "A", then securely tighten set screw (2).

Trip circuit breaker open and partially slow close until left pole arcing contacts just touch. Adjust the center and right hand poles so that their arcing contacts touch at the same time as the left hand pole arcing contacts, then securely tighten set screw (2).

Check center and right hand poles to insure at least 1/8 inch deflection. Make adjustments if necessary as above.

BRIDGE PIVOT PRESSURE (See Fig. 4)

Proper bridge pivot pressure should be made by first loosening set screw (6).

While holding bridge pivot bolt head (5), turn in opposite nut (7) firmly tight (approximately 75#) then back out nut approximately 1/6 turn (one flat).

After making adjustments, securely tighten set screw (6).

OPERATING MECHANISM

The operating mechanism is adjusted at the factory for proper operation and should not be disturbed unless the circuit breaker does not close electrically on reclosing duty.

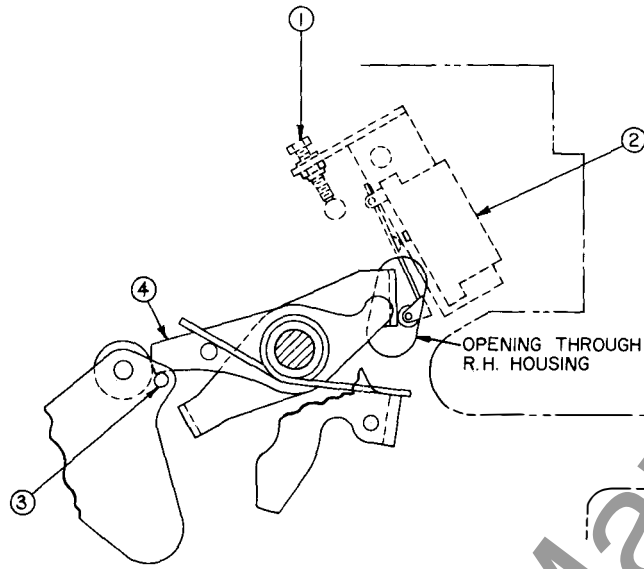


Fig. 5—Latch Check Switch Adjustment

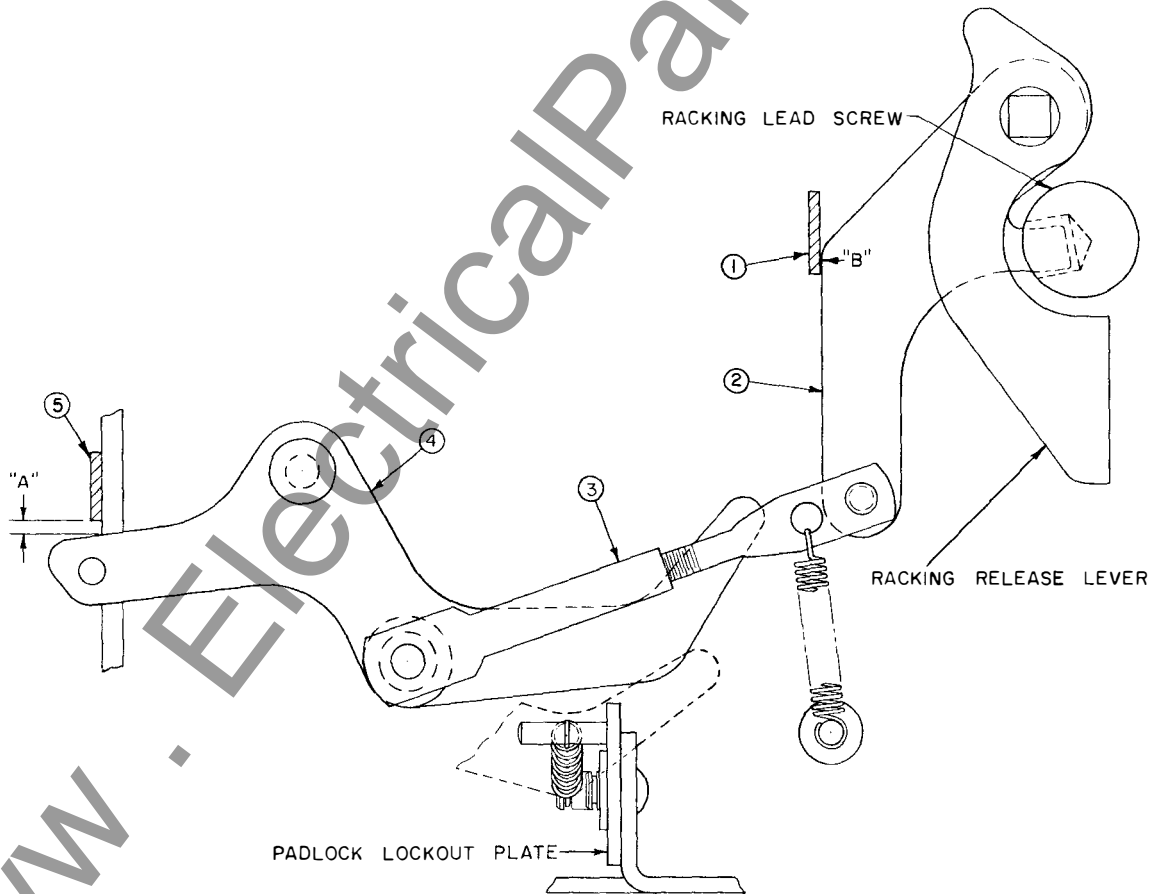


Fig. 6—Racking Mechanism



This may be caused if the latch check switch (when used) is not actuated. Circuit breaker should not close before trip latch (4, Fig. 5) has reset.

Adjustments should be made with latch (4) against reset stop pin (3) and turning in adjusting screw (1) until contacts of switch (2) "break" (as indicated by an audible click or check with bell ringer). Retract adjusting screw until switch contacts "make", then rotate adjusting screw one turn more. (Adjusting screw is self-locking.)

RACKING MECHANISM

The circuit breaker racking mechanism is adjusted for proper operation and should not be disturbed unless it is possible to close the breaker during a racking operation.

It may be possible that interlocked blocking members are not positioned properly, which should be corrected as follows:

(See Fig. 6)

With circuit breaker closed, make adjustments by regulating the length of connecting rod (3) for approxi-

mately 1/8 inch minimum clearance at "A" between trip link (5) and blocking lever (4) with racking lock lever (2) held against racking lock bracket (1) at "B".

ELECTRICAL OPERATING SEQUENCE

Please refer to the specific schematic diagrams and other operational information furnished with your order.

RENEWAL PARTS

We recommend sufficient renewal parts be stocked to insure proper maintenance and replacement of parts. The quantity of parts and items carried in stock should be based on the number of circuit breakers in service and previous operating experience.

When ordering renewal parts, address the nearest sales office of the I-T-E Circuit Breaker Company. Specify the type and serial number of the circuit breaker, description of part and quantity required.

A copy of applicable Renewal Parts Bulletin will be furnished on request.

Consult Our Sales Offices

The I-T-E Circuit Breaker Company is represented in all principal cities of the United States and Canada. These representatives are experienced and are competent to make correct applications, as well as give complete information and prices. We suggest you consult the representative nearest you.



I-T-E CIRCUIT BREAKER COMPANY

SWITCHGEAR DIVISION

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